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EXAMINER

PATEL, ISHWARBHAI B

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Please find below and/or attached an Office communication concerning this application or proceeding.



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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/620,127
Filing Date: July 15, 2003
Appellant(s): WONG ET AL.

MAILED

APR 07 2006

GROUP 2800

Gregory W. Osterloth
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed February 27, 2006 appealing from the Office action mailed August 23, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

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(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

3,729,816	Burns	5-1973
5,986,893	Leigh et al.	11-1993
6,604,967	Middlehurst et al.	8-2003

Japanese Patent No. JP401245547A to Tatsuya Tominaga, Pub. Date: 9-1989.

(Copy of English translation attached).

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 21 are rejected under 35 U.S.C. § 102(b) as being anticipated by
Tatsuya Tominaga, Japanese Patent No. JP401245547A.

Regarding claim 1, the claim is drafted as Product-by-Process. The process steps in the claim define the following device: **an air bridge having: one circuit component on a substrate, a crossover circuit trace of uniform composition, crossing over the circuit component.** The sacrificial material on which a crossover trace is formed, as recited on line 3-6 of the claim, is deposited and then decomposed and removed. Therefore the sacrificial material will not be present in the device of claim 1. Further, the device can be made using a sacrificial material or without using a sacrificial material. Furthermore, a process limitation defines the claimed invention over the prior art only to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

Tatsuya Tominaga, in figure 3, discloses an air bridge having: one circuit component (2) on a substrate (1), a crossover circuit trace (4) of uniform composition (as can be seen in the figure), crossing over the circuit component (2). As such Tatsuya Tominaga discloses all of the structural elements of the device of claim 1 and therefore, Tatsuya Tominaga anticipates the claim.

Regarding claim 21, the claim is drafted as Product-by-Process. The process steps in the claim define the following device: **one circuit component on a substrate, a crossover circuit trace of uniform composition, crossing over the circuit component, and being directly supported by the substrate on opposite sides.** The

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sacrificial material on which a crossover trace is formed, as recited on line 3-6 of the claim, is deposited and then decomposed and removed. Therefore the sacrificial material will not be present in the device of claim 21. Further, the device can be made using a sacrificial material or without using a sacrificial material. Furthermore, a process limitation defines the claimed invention over the prior art only to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

Tatsuya Tominaga, in figure 3, discloses an air bridge having: one circuit component (2) on a substrate (1), a crossover circuit trace (4) of uniform composition (as can be seen in figure), crossing over the circuit component (2), and being directly supported by the substrate (1) on opposite sides, (see figure 2). As such Tatsuya Tominaga discloses all of the structural elements of the device of claim 21 and therefore, Tatsuya Tominaga anticipates the claim.

Claims 1, 3, 4, 21 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Burns, US Patent No. 3,729,816.

Regarding claim 1, the claim is drafted as Product-by-Process. The process steps in the claim define the following device: **an air bridge having: one circuit component on a substrate, a crossover circuit trace of uniform composition,**

crossing over the circuit component. The sacrificial material on which a crossover trace is formed, as recited on line 3-6 of the claim, is deposited and then decomposed and removed. Therefore the sacrificial material will not be present in the device of claim 1. Further, the device can be made using a sacrificial material or without using a sacrificial material. Furthermore, a process limitation defines the claimed invention over the prior art only to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

Burns, in figure 5, discloses an air bridge having: one circuit component (23) on a substrate (21), a crossover circuit trace (29) of uniform composition (as made of same conductive material), crossing over the circuit component (23). As such Burns discloses all of the structural elements of the device of claim 1. Therefore, Burns anticipates the claim.

Regarding claim 3, the applicant is further claiming polynorbornene as a sacrificial material used for forming the air bridge. However, using polynorbornene, as a sacrificial material for forming the air bridge is further a part of the process steps and as explained and applied to claim 1 above the sacrificial material is deposited and then decomposed and removed. Therefore the sacrificial material will not be present in the device of the claim. As such Burns discloses all of the structural elements of the device of claim 3 as applied to claim 1 above. Therefore, Burns anticipates the claim.

Regarding claim 4, Burns further disclose the circuit components comprise a circuit trace (circuit path 23, column 4, line 21-24).

Regarding claim 21, the claim is drafted as Product-by-Process. The process steps in the claim define the following device: **one circuit component on a substrate, a crossover circuit trace of uniform composition, crossing over the circuit component, and being directly supported by the substrate on opposite sides**. The sacrificial material on which the crossover trace is formed, as recited on line 3-6 of the claim, is deposited and then decomposed and removed. Therefore the sacrificial material will not be present in the device of claim 21. Further, the device can be made using a sacrificial material or without using a sacrificial material. Furthermore, a process limitation defines the claimed invention over the prior art only to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

Burns, in figure 5, discloses an air bridge having: one circuit component (23) on a substrate (21), a crossover circuit trace (29) of uniform composition (as made of same conductive material), crossing over the circuit component (23), and being directly supported by the substrate on opposite sides, (base that hold in place, i. e. it is

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supported directly by substrate 21). As such Burns discloses all of the structural elements of the device of claim 21. Therefore, Burns anticipates the claim.

Regarding claim 23, the applicant is further claiming polynorbornene, as a sacrificial material used for forming the air bridge. However, using polynorbornene as a sacrificial material for forming the air bridge is further a part of the process steps and as explained and applied to claim 1 above the sacrificial material is deposited and then decomposed and removed. Therefore will not be present in the device of claim. As such Burns discloses all of the structural elements of the device of claim 23 as applied to claim 21 above. Therefore, Burns anticipates the claim.

Regarding claim 24, Burns further disclose the circuit components comprise a circuit trace (circuit path 23, column 4, line 21-24).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-8 and 25-28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Burns, US Patent No. 3,729,816, as applied to claims 1 and 21

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above, and further in view of Middlehurst et al., US Patent No. 6,604,967, alternately Leigh et al., US Patent No. 5,986,893.

Regarding claim 5, the applicant is further claiming the circuit trace comprises a signal trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 4 above, but fails to explicitly disclose the said trace comprise a signal trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the circuit trace comprises a signal trace" implies that the circuit trace is used as a signal trace. As disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for signal transmission.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the trace of Burns as a signal trace, as taught by Middlehurst or Leigh, in order to transmit a signal.

Regarding claim 6, the applicant is claiming the circuit trace comprises a ground trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 4 above, but fails to explicitly disclose the said trace comprise a ground trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the circuit trace comprises a ground trace" implies that the circuit trace is used as a ground trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing ground connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the circuit trace of Burns as a ground trace, as taught by Middlehurst or Leigh, in order to provide the grounding connection.

Regarding claim 7, the applicant is claiming the circuit trace comprises a power trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 4 above, but fails to explicitly disclose the said trace comprise a power trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the circuit trace comprises a power trace" implies that the circuit trace is used as a power trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing power connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the circuit trace of Burns as a power trace, as taught by Middlehurst or Leigh, in order to provide the power connection.

Regarding claim 8, the applicant is claiming the cross over circuit trace comprises a signal trace.

Burns discloses all the features of the claimed invention including the crossover circuit trace (29, figure 5) as applied to claim 1 above, but fails to explicitly disclose the said crossover trace comprises a signal trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the crossover circuit trace comprises a signal trace" implies that the crossover circuit trace is used as a signal trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing signal connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the crossover circuit trace of Burns as a signal trace, as taught by Middlehurst or Leigh, in order to transmit a signal.

Regarding claim 25, the applicant is further claiming the circuit trace comprises a signal trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 24 above, but fails to explicitly disclose the said trace comprise a signal trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the circuit trace comprises a signal trace" implies that the circuit trace is used as a signal trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for signal transmission.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the circuit trace of Burns as a signal trace, as taught by Middlehurst or Leigh, in order to transmit a signal.

Regarding claim 26, the applicant is claiming the circuit trace comprises a ground trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 24 above, but fails to explicitly disclose the said trace comprise a ground trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore to be used as signal trace, power trace or ground trace. Furthermore, the limitation "the circuit trace comprises a ground trace" implies that the circuit trace is used as a ground trace and as disclosed by Middlehurst

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et al., and Leigh, it is well known in the art to use a trace for providing ground connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the circuit trace of Burns as a ground trace, as taught by Middlehurst or Leigh, in order to provide the grounding connection.

Regarding claim 27, the applicant is claiming the circuit trace comprises a power trace.

Burns discloses all the features of the claimed invention including the circuit trace (23, figure 5) as applied to claim 24 above, but fails to explicitly disclose the said trace comprise a power trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the circuit trace comprises a power trace" implies that the circuit trace is used as a power trace and as

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disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing power connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the circuit trace of Burns as a power trace, as taught by Middlehurst or Leigh, in order to provide the power connection.

Regarding claim 28, the applicant is claiming the cross over circuit trace comprises a signal trace.

Burns discloses all the features of the claimed invention including the crossover circuit trace (29, figure 5) as applied to claim 21 above, but fails to explicitly disclose the said crossover trace comprises a signal trace.

Middlehurst et al., in figure 1 and 2, discloses low profile connector assembly with a circuit board 36, having plurality of traces 46 and further discloses that the traces 46 include a plurality of power traces 46a for carrying energy or power, signal traces 46b for carrying electrical signals and a ground trace 46c (column 3, line 35-45).

Leigh et al., in figure 2B, also discloses a printed circuit board 18 for high speed signal transmission with signal trace 16 and power / ground traces 14 (column 3, line 63-67).

Further, for the functioning of an electronic device, traces on the board have to be used as a signal trace, a power trace or a ground trace depending upon a the specific requirements of the device. Furthermore, the limitation "the crossover circuit trace comprises a signal trace" implies that the crossover circuit trace is used as a

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signal trace and as disclosed by Middlehurst et al., and Leigh, it is well known in the art to use a trace for providing signal connection.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to construe the crossover circuit trace of Burns as a signal trace, as taught by Middlehurst or Leigh, in order to transmit a signal.

(10) Response to Argument

Appellant's first arguments for the rejection of claims 1 and 21 under 35 USC 102(b) by Tatsuya Tominaga, states that the examiner reads out the steps of depositing and thermally decomposing a sacrificial material because, in the Examiner's opinion, these steps do not impart any structural limitations on the end product - i.e., a circuit trace crossing over a circuit component to form an air bridge. However, Appellants believe the Examiner is construing MPEP § 2113 and § 2173.054p) too broadly. That is, the "distinctive structural characteristic" that a manufacturing process step needs to impart to a final product for the final product to distinguish over the prior art can be small. Appellant further states that Tominaga's teaching provides absolutely no indication of how the "space 3" or "wiring 4" is formed and the degree of precision with which Tominaga may define an air bridge is unknown, and it is merely speculation that Tominaga can achieve the same degree of precision offered by Appellants' air bridge production process using a "sacrificial material" that precisely predefines the shape of a resultant cross-over circuit trace. **This is not found to be persuasive.** The examiner

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has considered the method steps to the extent the method steps describe the structure. There is no specific degree of precision explicitly recited in the claim. The claim recites a circuit component on a substrate and cross over circuit trace of uniform composition crossing over the circuit component. As explained in the rejection the circuit component on a substrate and cross over circuit trace of uniform composition are clearly shown in figure 3 of Tominaga and clearly set forth in the rejection. Tominaga meets the structural limitations defined by the claim language and anticipates the claim. Furthermore, despite Appellant's numerous assertions that the method of forming the air bridge structurally distinguishes the claimed air bridge from the prior art, Appellant has never pointed out what the difference is. Examiner has carefully reviewed the structure of the claimed invention and the prior art and cannot see any difference whatsoever. The degree of precision mentioned, to the extent that applicant has defined, this precision also seems to be set forth in the structure of prior art. The prior art structure seems very precise, it has a particular shape and attaches correctly on the traces of the substrate.

Appellant's second argument for the rejection of claims 1, 3, 4, 21, 23, and 24 under 35 U.S.C. § 102(b) by Burns, states that again, the examiner seems to downplay the product-by-Process limitations of Appellant's claim 1 and 21 and **further states that although Burns' teachings imply some degree of precision for the formation of the crossover member 16**, the extra steps to transfer the crossover member 16 from the carrier member 20 to the dielectric substrate 11, and to bond the crossover member

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16 to the conductive elements 12 and 14, appear to present alignment, bonding and other tolerance issues which are mitigated or eliminated in Appellants' claimed products.

This is not found to be persuasive. The examiner has considered the method steps to the extent the method steps describe the structure. There is no specific degree of precision explicitly recited in the claim. As explained in the rejection and as explained above, the prior art of Burns clearly shows the circuit component on a substrate and a cross over circuit trace in figure 5 and clearly set forth in the rejection. The structure of Burns seems very precise, it has a particular shape and attaches correctly on the traces of the substrate. Burns meets the structural limitations defined by the claim language and anticipate the claims.

Appellant's third argument for the rejection of claims 5-8 and 25-28 under 35 USC § 103 (a) Burns in view of Middlehurst and Leigh, states that claims 5-8 and 25-28 are allowable at least for the reason that they depend from allowable claims 1 and 21, and because Middlehurst and Leigh fails to disclose limitations of parent claims 1 and 21 as per previous argument. **This is not found to be persuasive.** Middlehurst and Leigh are used as a secondary reference for the claims 5-8 and 25-28. As explained above, Burns discloses the structure of the parent claims 1 and 21. Therefore, Burns in view of Middlehurst and Leigh meets the structural limitations defined by the claim language and discloses the claims.

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(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,


Ishwar (I. B.) Patel

March 29, 2006

Conferees:

Darren Schuberg 


Kammie Cuneo


Ishwar (I. B.) Patel